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National Research Council
(U.S.)

Report of the Geology and
Paleontology Committee

[Washington, D.C.]

[1917]

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NATIONAL RESEARCH COUNCIL

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REPORT OF THE GEOLOGY AND PALEONTOLOGY COMMITTEE

Reprinted from the Proceedings of the NATIONAL ACADEMY OF SCIENCES
Vol. 3, pp. 721-724, December, 1917

NATIONAL RESEARCH COUNCIL

REPORT OF THE GEOLOGY AND PALEONTOLOGY COMMITTEE

At the organization of this Committee in January, 1917, its Chairman had been authorized by the Geological Society of America to appoint a Committee which should be charged with the effort to fortify the instruction in geology given in civil engineering training in the technical schools of the country. With the approval of the Executive Committee of this Council, this function was taken over as proper to the present Committee, and in this capacity it has served as such Committee of the Geological Society of America. Upon this phase of its activity and on favorable results secured by assurances from various engineering schools of high standing, a report has already been made to the geologists of the country. Changed conditions since the entry of the country into the war may delay, for a while, the perfection of the program urged by the Committee.

As a preliminary procedure, a census was made of all the geologists of the United States, with special reference to their training, their special investigations in progress, special lines of research planned, effective lines of possible public service and the regions of the United States with whose topography and geology they had an intimate acquaintance. This has served as the basis of correspondence, reference and inquiry in the course of the organization.

To make clear to the military officers the nature of the service which geologists could render, a brochure entitled *What a Geologist Can Do in War* was printed in a large edition and freely distributed among the officers. This was a very brief statement in entirely untechnical language, put together in convenient form for the pocket, and since the original circulation of it, the demand for copies from various sources has been large.

1. *Materials and Facilities for Rapid Road and Fortification Construction.*—The purpose of this undertaking has been to bring together and organize for the use of the Engineers Corps, outstanding data bearing on the natural available supply of material for quick road and fortification construction along the Atlantic seaboard; to indicate upon maps the locations of immediately available supplies of every sort, and to tabulate for prompt reference the capacity of all commercial workings.

The area covered includes all of the states from Maine to Texas, with an intensive detailed study of certain states covering a belt from 10 to 20 miles back from the coast line. The work has been performed gratuitously by geologists familiar with the local conditions in each of the states in association with highway engineers representing the American Association of State Highway Officials, the full reports by states covering (a) the topography, climate, and geological conditions; (b) a digest of the active and inactive quarries, quarry sites, sand and gravel pits, rubble piles, and stone walls where mate-

rials may be obtained quickly; (c) a summary of road machinery available at given points, and a list of engineers with their qualifications for undertaking road and bridge construction; (d) and a series of maps representing this information cartographically. Two sets of the detailed reports for file in the general and departmental archives have been prepared in bound volumes and atlas cases for ready reference. The reports have been abstracted and conditions summarized by Military Departments and State Divisions.

Eventually, and because of the value of the compiled data, the entire work will, it is hoped, be put in permanent form.

2. *Measurement of Earth Vibrations as a Means of Locating Heavy Batteries.*—It was early suggested that a perfected seismographic apparatus might be devised which would be competent to detect and measure, by earth vibrations, the distance of heavy artillery discharges. The matter was studied carefully by the most competent seismologists, and Dr. Reid, of the Committee, on his trip to the war front, was specially commissioned to look into any actual or possible applications of this service. The service which it was thought ought to be rendered by seismic ranging, is now being given by sound ranging and airplane observation. Dr. Reid, however, a member of this Committee, has given successful attention to the means of correcting the troublesome compass variation in rapidly-moving airplanes, in which work he has cooperated with the Committee on Physics of the Research Council.

3. *Water Supply for Camps.*—This subcommittee was organized under the title of *Camp Sites and Water Supply*, in the expectation that the knowledge the members were competent to supply would be of service in the selection of camp sites, with reference to quality of soil, topography and under-drainage, ground water and deep water distribution. In the location of the present camps this knowledge was only incidentally used, it being assumed that other agencies were adequate.

As the military camps are now located, the subcommittee retains its organization to meet any demands for information regarding water supply or other questions which may develop with the growth and further movements of the Army.

4. *War Minerals.*—The Subcommittee on Imported Minerals, instituted by this Committee, has merged into an independent Committee on War Minerals, constituted to represent the American Institute of Mining Engineers, United States Geological Survey, United States Bureau of Mines and the National Research Council.

As its operations combine the joint activities of several organizations, it is transmitting its reports through the organizations in its representation. The Committee has been effective for the past four months, in which time it has taken a census of the minerals required in war preparations of all kinds, particularly with reference to amounts imported, stock on hand, production, active and suspended, possible enlargement of production; and it has inaugurated surveys in several states, partly under Government and partly under

state auspices, for the purpose of perfecting data of present and increased production, to determine new ore bodies and invite prompt exploitation thereof. The work is important; it has already instigated wide-spread activity throughout the country in the search for mineral supplies; it has ascertained with approximate accuracy the most imperious exigencies of these war industries; it has led to direct recommendations to the Secretary of War; and it is effectively aiding the labors of the War Industries Board.

5. *Pacific Coast Sub-committee on Geology.*—This has recently been organized for active service. Its personnel is made up of men representing the states of California, Nevada, Oregon and Washington, and in its Chairman and several of his associates has the benefit of experience and achievement in connection with the scientific work of the State Defense Council of California.

6. *Geology of Cantonments and Geological Instruction in Training Camps.*—This sub-committee has recently been organized and the work it has laid out consists in:

- (a) The preparation of topographic and geological maps of the cantonments and camps and their environs, for a radius of about 20 miles.
- (b) Preparation of descriptive matter explanatory of such maps, to be printed, both with them and in separate pamphlet form.
- (c) Provision for instruction in geology and physiography, to be undertaken in connection with the mobilization and training camps.

Each phase of this work has been initiated. The preparation of the maps and their description are being carried out by the Government and the State Geological Surveys. The courses of instruction, if approved by the War Department, will be given in most cases by geographers and geologists who are conveniently situated with reference to the geographical location of the camps.

7. Among the earliest suggestions of service before this Committee was the possibility of constructing a superior armor for the National Army, on the basis of the construction in the armored Devonian fishes.

In conjunction with the Sub-committee on Protective Body Armor of the Engineering Committee of the Council and under the direction of the Ordnance Bureau, Dr. Dean, curator of the Department of Arms and Armor in the Metropolitan Museum and of Fossil Fishes in the American Museum, a member of this Committee, has designed effective models for new armor which are now being manufactured for trial in actual field operations.

8. The hope of the Committee has been to attach a geologist in an advisory capacity, to each military unit of large size. This end has not yet been attained; some geologists, former members of Officers Training Camps, hold commissions in France with the Commanding General; a number are now in active service here, and under instructions from the Secretary of War, a list has been compiled of all geologists willing to accept commissions in any department of the Army. This list is a large one and the intimations of the

Secretary of War are that, as the military activities develop, additional calls will be made for active field service by the geologists.

9. The 'Plan of Service' submitted by the Committee has now been approved, in general, by the Engineer Officers and the Secretary of War. This plan of service laid special emphasis on the importance of our ability to interpret soil and rock conditions in relation to trenchability, tunneling, and the location and control of ground water.

J. M. CLARKE, *Chairman*

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